

PATENT SPECIFICATION

DRAWINGS ATTACHED

Inventors: FREDERICK BRYDONE REED and ERNEST EUGENE GARDINER

L186,655

L186,655



Date of filing Complete Specification (under Section 3 (3) of the Patents Act 1949): 29 Jan., 1969.

Application Date: 6 Feb., 1968. No. 5775/68.

Application Date: 13 Feb., 1968. No. 7001/68.

Application Date: 20 Feb., 1968. No. 8171/68.

Application Date: 1 March, 1968. No. 9981/68.

Complete Specification Published: 2 April, 1970.

Index at acceptance: —F4 W57; F4 R5C3; G5 C(70D, 72)

International Classification: —F 24 c 15/06

COMPLETE SPECIFICATION

Electric Illumination Devices

We H. FROST & COMPANY LIMITED, a British Company, of 34, Fieldgate, Walsall, Staffordshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to electric illumination devices and an object of the invention is to provide simple and effective means for producing a simulated flame effect combined with a simulated fuel effect.

According to the invention, an electric illumination device comprises a translucent viewing screen; imitation solid fuel means; suspended flexible material disposed inwards of the viewing screen; a light source disposed inwards of the flexible material; and means for causing air flow for moving the flexible material to vary the lighting effect imparted by the device; the arrangement being such that when the device is in operation, the movement of upper portions of the flexible material in relation to light from the light source causes a random flickering effect visible, as a flame effect, through the viewing screen, and the movement of lower portions of the flexible material in relation to light from the light source causes a random flickering effect illuminating, from within the device, the imitation fuel means.

The suspended flexible material may be constituted by a row of flexible strips. There may be disposed intermediate the light source and the suspended flexible material a translucent inner screen which extends upwards for most of the height of the suspended flexible material and is illuminated by light from the light source, said translucent inner screen forming a backing panel spaced be-

hind the upper portions of the suspended flexible material, substantially all the light reaching the viewing screen from the light source, but substantially none of the light reaching the imitation solid fuel means from the right source, being diffused by this translucent inner screen. Or, the said translucent inner screen may be omitted. In one embodiment of the invention the line in plan of the flexible material is substantially rectilinear and the line in plan of the viewing screen is of a U-shaped formation. In another embodiment the line in plan both of the flexible material and the viewing screen is basically of a U-shaped formation, and in a further embodiment the line in plan both of the flexible material and of the viewing screen is circular in form.

Figure 1 of the accompanying drawings shows, partly in elevation and partly in vertical section, a front view of an electric illumination device constructed in accordance with the present invention, said illumination device being illustrated by way of example.

Figure 2 is a side elevation of the illumination device shown in Figure 1.

Figure 3 is a vertical section on the line III—III, Figure 1.

Figure 4 is a vertical section through another embodiment of the invention.

Figures 5 and 6 are vertical sections through two further embodiments of the invention.

Figure 7 is on a smaller scale than Figures 1 to 6 and is an elevation of another embodiment of the invention.

Figures 8 and 9 are sectional views on the lines VIII—VIII, Figure 7 and IX—IX, Figure 7, respectively.

Figure 10 is a horizontal sectional view

45

50

55

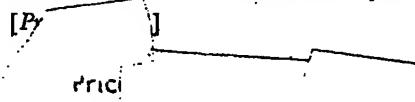
60

65

70

75

80



BEST AVAILABLE COPY

visible through the viewing screen 2, and the movement of the lower portions 6b of the strips 6 in relation to light from the light source results in a random flickering effect 5 illuminating, from within the device, the imitation fuel means 3 whereby a realistic appearance is imparted to the translucent portions of the imitation fuel means, as in the embodiment shown in Figures 1 to 3. In the 10 case of this embodiment shown in Figure 4, substantially all the light reaching the viewing screen 2 from the light source 9, but substantially none of the light reaching the imitation fuel means 3 from said light source 15 9, is diffused by the translucent inner screen 14.

If desired, the flexible strips 6 in the arrangement described with reference to Figure 4 may, instead of being translucent, 20 be opaque strips.

The embodiment shown in Figure 5 is of the same construction as shown that in Figures 1 to 3, except that there is added, 25 within the front portion (shown at 3a) of the imitation fuel means 3, a horizontal reflector 15 spaced beneath the top of said front portion 3a, said reflector increasing the movement and intensity of the light effect visible through the upper part of the front portion 30 3a of the imitation fuel means.

The embodiment shown in Figure 6 is likewise of the same construction as the embodiment shown in Figures 1 to 3, except that in this case there is added, within the front portion 3a of the imitation fuel means, an additional red or orange electric light source 16 which subdues the movement of, and increases the intensity of, the light effect visible 35 through the lower part of the said front portion 3a. A horizontal opaque light baffle 17, which may be of aluminium is spaced immediately above the said additional light source 16, whereby to minimise the effect 40 of the light source 16 on the movement of the light visible through the upper part of the front portion 3a of the imitation fuel means. The light baffle 17 has its upper surface finished to act as a reflector surface.

The above embodiments may be modified, 50 if desired, by making the viewing screen straight, or slightly bowed, instead of U-shaped.

Figures 7 to 9 show an embodiment in 55 which a translucent viewing screen 2', the line of a row of suspended flexible strips 6, a moulding 3' representing imitation fuel means, and an inner translucent light-diffusing screen 14', are all in plan, of a circular formation. A red or orange light source 9' 60 is disposed inside a central space 19 defined by the circular inner screen 14'. An impeller 18 is provided for producing air flow for imparting a fluttering movement to the strips 6, and when the device is in operation some 65 of the light from the light source 9' passes

to the upper portions 6a of the strips 6 whereby a flickering flame effect is visible through the viewing screen 2', and some of the light from said source passes to the lower portions 6b of the strips whereby the imitation fuel means 3' is illuminated by a random flickering effect. That part of the light from the source 9' which passes to the said upper portions 6a of the strips passes through the inner translucent screen 14', whilst that part of the light from said source which passes to the lower portions 6b of the strips passes undiffused through an annular air gap 14'a below the screen 14'. The flame effect and the fuel effect are visible from any side of this particular embodiment, and the said embodiment is designed to simulate a circular fire-place. The imitation fuel 3' is surrounded at the bottom by a circular wall 22, and the double-walled cylindrical structure formed by the screens 2', 14', is surmounted by a coned hood 20 leading to a simulated (but sealed) central cylindrical chimney. The inner screen 14' is supported by brackets such as those indicated at 21; and when the device is in operation air from the impeller flows, as shown by the arrows, down through the space 19, then through the gap 14'a, then up past the strips 6, and then back to the impeller for re-circulation.

Figure 10 shows, in horizontal cross-section an embodiment in which a translucent viewing screen 2'', the line of a row of suspended flexible strips 6, a moulding 3'' representing imitation fuel means, and an inner translucent screen 14'' are all, in plan, of a U-shaped formation. A red or orange light source 9'' is disposed inwards of the inner screen 14'' and when the device is in operation, with the strips 6 caused to flutter by air from an impeller (not shown), some of the light from the light source 9'' passes through the inner screen 14'' to upper portions of the strips 6 whereby a flickering flame effect is visible through the viewing screen 2'', and some of the light from said source 9'' passes undiffused beneath the screen 14'' whereby the imitation fuel 3'' is illuminated by a random flickering effect, the said flame effect and fuel effect being visible from the front and two opposite sides of the device. The device is provided with a base 23.

In any of the above-described embodiments, the viewing screen 2, 2', or 2'', may have a light diffusing surface having a multiplicity of closely-adjacent thin horizontal or near horizontal broken or unbroken lines extending from one side of the screen to the other and formed in a manner described in the specification of our United Kingdom Patent No. 957591. In the case of those of the embodiments described which have an inner translucent screen 14, 14', or 14'', the said screen 14 (which may, if desired, be

70

75

80

85

90

95

100

105

110

115

120

125

130

red or orange coloured) may have a light-diffusing surface having a multiplicity of closely-adjacent thin substantially horizontal lines formed in a manner described in our 5 said specification No. 957591 and a multiplicity of closely-adjacent thin substantially vertical lines to produce a criss-cross pattern on the said screen.

If desired, the flexible strips may be caused 10 to move by air drawn from outside, but it is preferred that the strips be moved not by air from outside but by air circulating in a substantially air-tight enclosure, in order, as hereinbefore explained, to avoid or minimise 15 soiling of the strips by air-borne dust. Preferably, the air-moving arrangement is such that there is an even flow of air over the strips for the entire length of the row, whereby all the strips move to substantially the 20 same extent, as in the case of the embodiment shown in Figures 1 to 3. If desired the arrangement may be such that the air flows downwards, instead of upwards, over the flexible strips.

25 The suspended flexible material may, instead of being in the form of separately-suspended flexible strips, if desired be in the form of a flexible sheet which has translucent portions, and/or is slit or cut away, 30 the arrangement being such that when the device is in operation the movement of upper portions of the sheet in relation to light from the light source results in a flame effect visible through the viewing screen, 35 and the movement of lower portions of the sheet in relation to light from the light source results in the imitation fuel being illuminated by a random flickering effect. An example of an embodiment utilising a flexible sheet is illustrated in Figure 11, which 40 shows a device which is of the same construction as that illustrated in Figures 1 to 3 except that in place of the flexible strips 6 there is provided a suspended flexible sheet 45 24 which is slit or cut away to provide a plurality of strips in the form of depending flexible tongues 25. The top edge of the sheet 24 is anchored to the bracket means 7, and the bottom ends of the tongues 25 are 50 anchored to the bracket means 8. When the device is in operation the movement of upper portions 25a of the tongues 25 results in a flame effect visible through the viewing screen 2, and the movement of lower portions 25b of the tongues 25 results in a 55 random flickering effect illuminating the imitation fuel means 3.

The device may, if required, form part of an electric heater.

60 Having regard to the provisions of Section 9 of the Patents Act, 1949, attention is directed to the claims of our Patent No. 978364.

65 **WHAT WE CLAIM IS:—**

1. An electric illumination device comprising a translucent viewing screen; imitation solid fuel means; suspended flexible material disposed inwards of the viewing screen; a light source disposed inwards of the flexible material; and means for causing air flow for moving the flexible material to vary the lighting effect imparted by the device; and the arrangement being such that, when the device is in operation, the movement of upper portions of the flexible material in relation to light from the light source causes a random flickering effect visible, as a flame effect, through the viewing screen, and the movement of lower portions of the flexible material in relation to light from the light source causes a random flickering effect illuminating, from within the device, the imitation fuel means.

70

2. An electric illumination device, as claimed in claim 1, wherein the suspended flexible material is constituted by a row of flexible strips.

75

3. An electric illumination device, as claimed in claim 1 or 2, wherein the line in plan of the flexible material is substantially rectilinear.

80

4. An electric illumination device as claimed in claim 1 or 2 wherein the line in plan of the flexible material and of the viewing screen is basically of a U-shaped formation.

85

5. An electric illumination device, as claimed in claim 1 or 2, wherein the line in plan of the flexible material and of the viewing screen is circular in form.

90

6. An electric illumination device, as claimed in any one of claims 1 to 5, wherein a translucent inner screen is disposed intermediate the light source and the suspended flexible material and extends upwards for most of the height of the suspended flexible material and is illuminated by light from the light source, said translucent inner screen forming a backing panel spaced behind the upper portions of the suspended flexible material, substantially all the light reaching the viewing screen from the light source, but substantially none of the light reaching the imitation solid fuel means from the light source, being diffused by this translucent inner screen.

95

7. An electric illumination device, as claimed in claim 1 or 2, wherein there is disposed, beneath a top portion of the imitation fuel means, a reflector which increases the movement and intensity of light visible through said imitation fuel means.

100

8. An electric illumination device, as claimed in claim 1 or 2, wherein there is disposed, inwards of a lower portion of the imitation fuel means, an additional light source which subdues the movement of, and increases the intensity of, the light effect visible through the said lower portion of the imitation fuel means, said additional light

105

- 110

115

- 120

125

- 130

source having disposed above it a light baffle which reduces the effect of the additional light source on the movement of the light visible through an upper portion of the imitation fuel means, and said light baffle having an upper surface finished to act as a reflector. 5 substantially as herein described with reference to Figure 6 of the accompanying drawings.

9. An electric illumination device, as claimed in claim 3 wherein the viewing screen 10 is of a U-shaped formation in plan. 14. An electric illumination device, substantially as herein described with reference to Figures 7 to 9 of the accompanying drawings. 25

10. An electric illumination device, substantially as herein described with reference to Figure 1 to 3 of the accompanying drawings. 15. An electric illumination device, substantially as herein described with reference to Figure 4 of the accompanying drawings. 30

11. An electric illumination device, substantially as herein described with reference to Figure 5 of the accompanying drawings. 16. An electric illumination device, substantially as herein described with reference to Figure 11 of the accompanying drawings. 35

12. An electric illumination device, substantially as herein described with reference to Figure 6 of the accompanying drawings. 17. An electric heater incorporating an electric illumination device, said illumination device being constructed in accordance with any one of the preceding claims.

13. An electric illumination device, sub-

H. N. & W. S. SKERRETT,
24 Temple Row, Birmingham 2.
Agents for Applicants

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1970.
Published by the Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.

FIG. 3.

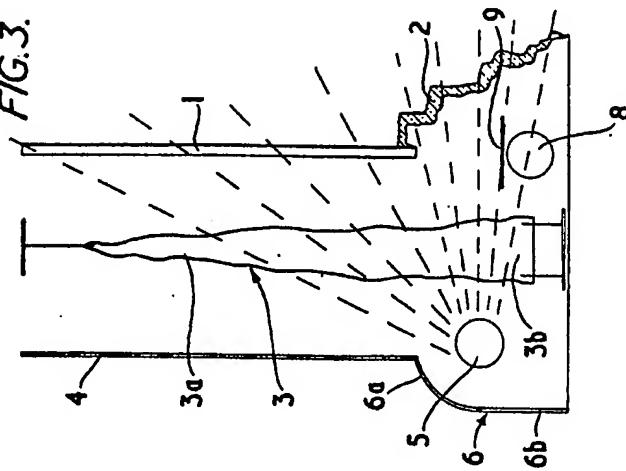


FIG. 2.

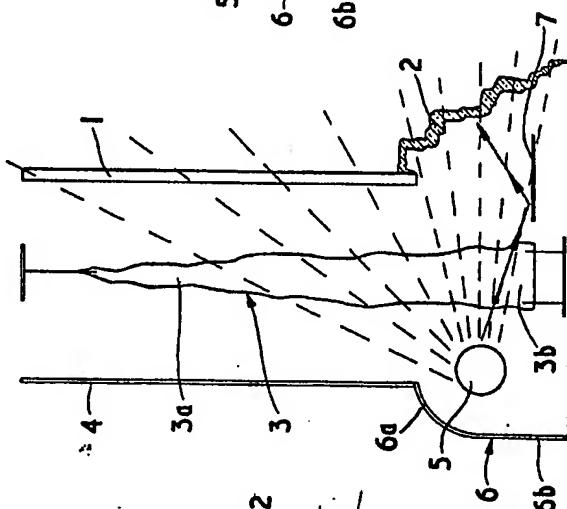
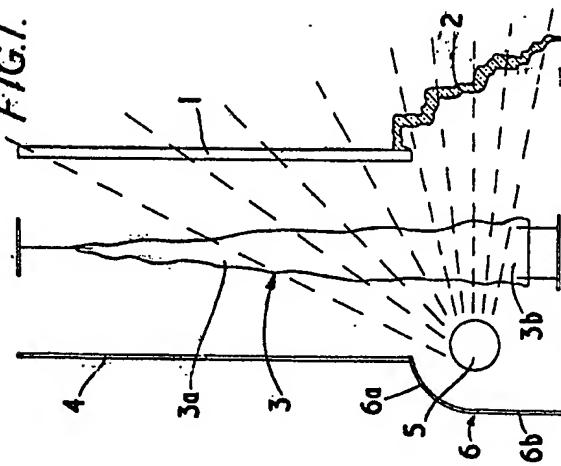


FIG. 1.



1186655 PROVISIONAL SPECIFICATION No.998168
1 SHEET *This drawing is a reproduction of
the Original on a reduced scale.*

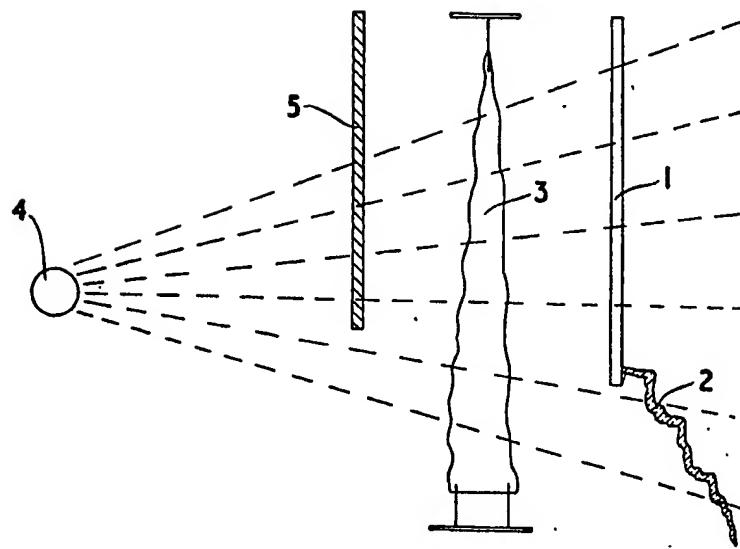


FIG.1.

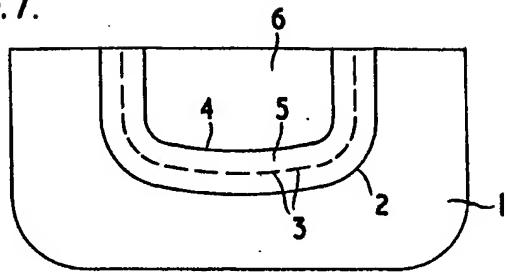


FIG.2.

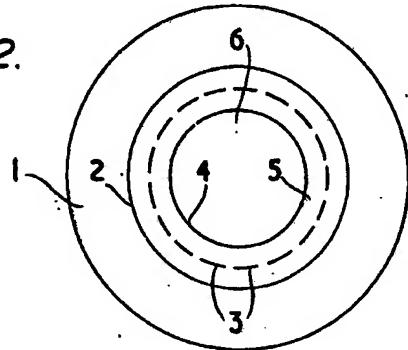
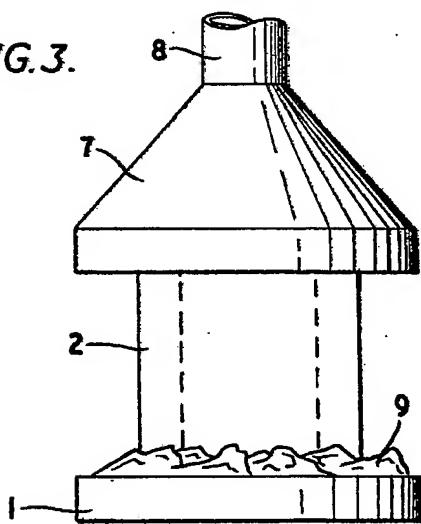
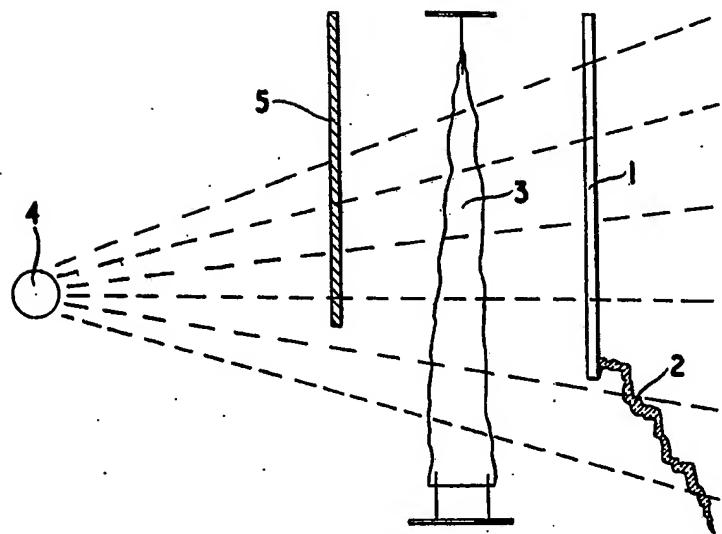
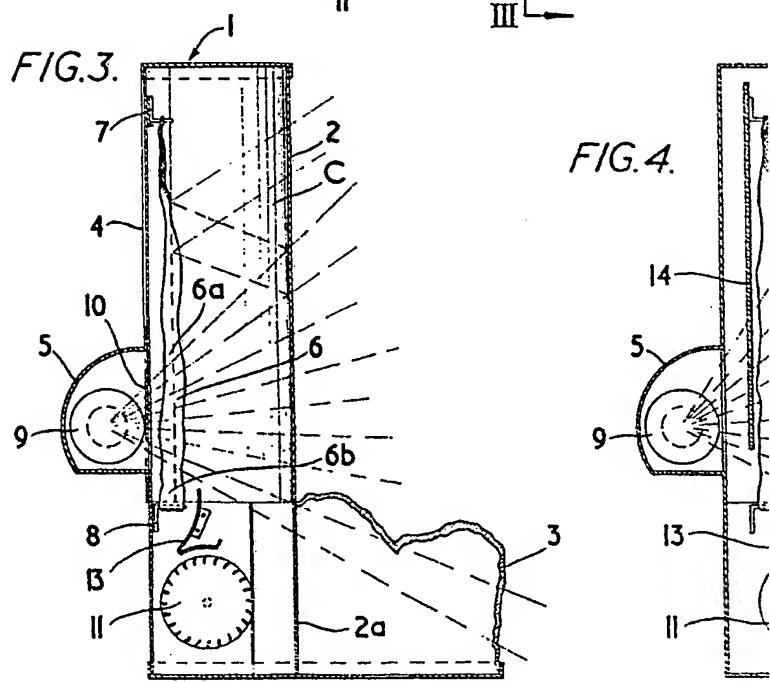
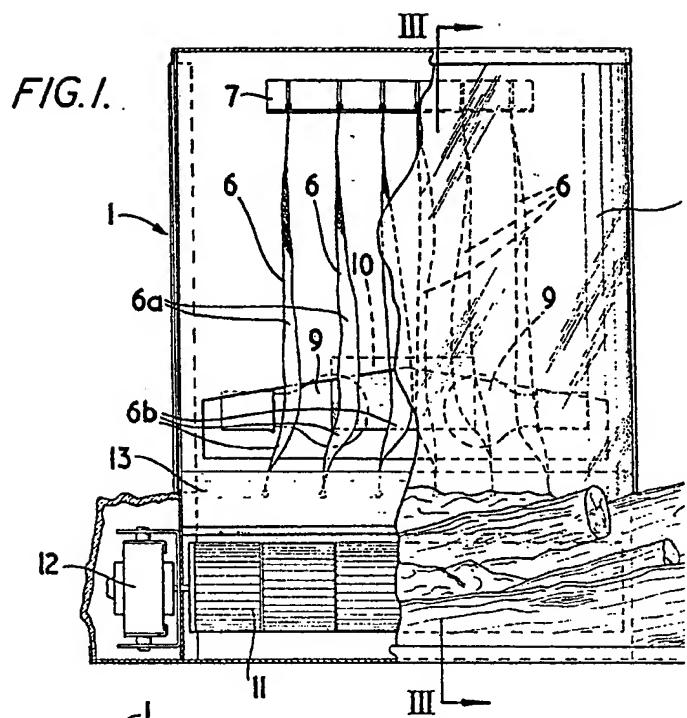


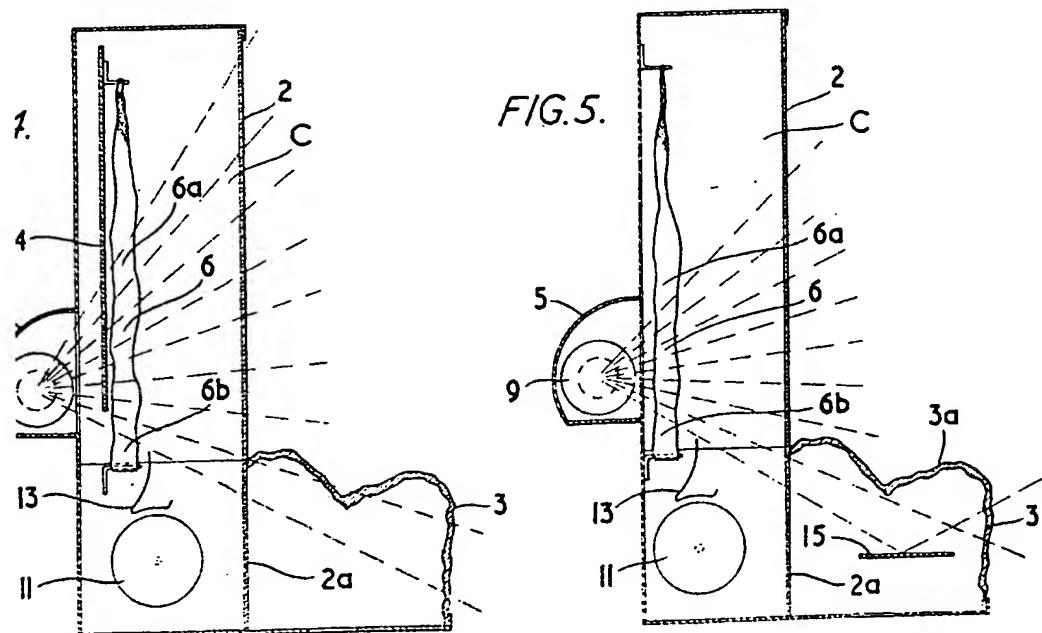
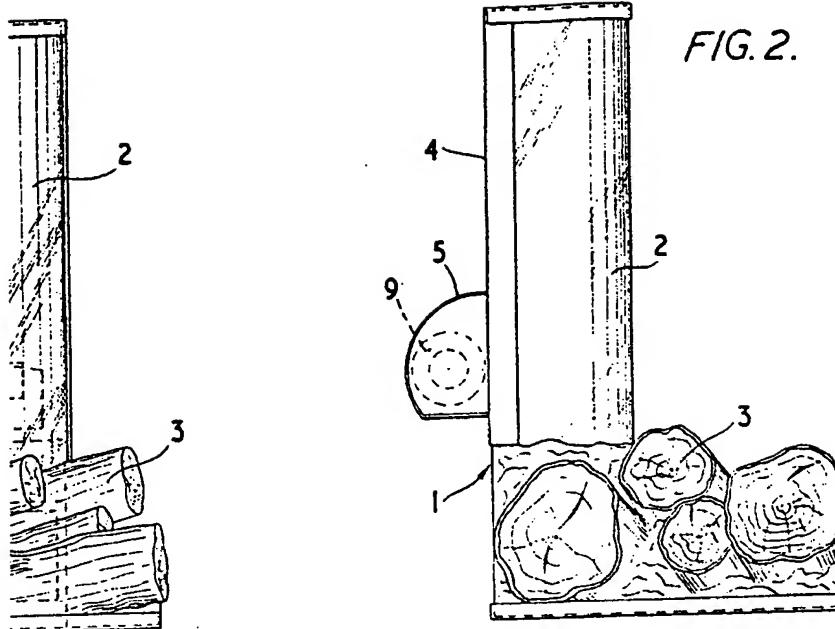
FIG.3.



1186655 PROVISIONAL SPECIFICATION No.700168
1 SHEET
*This drawing is a reproduction of
the Original on a reduced scale*







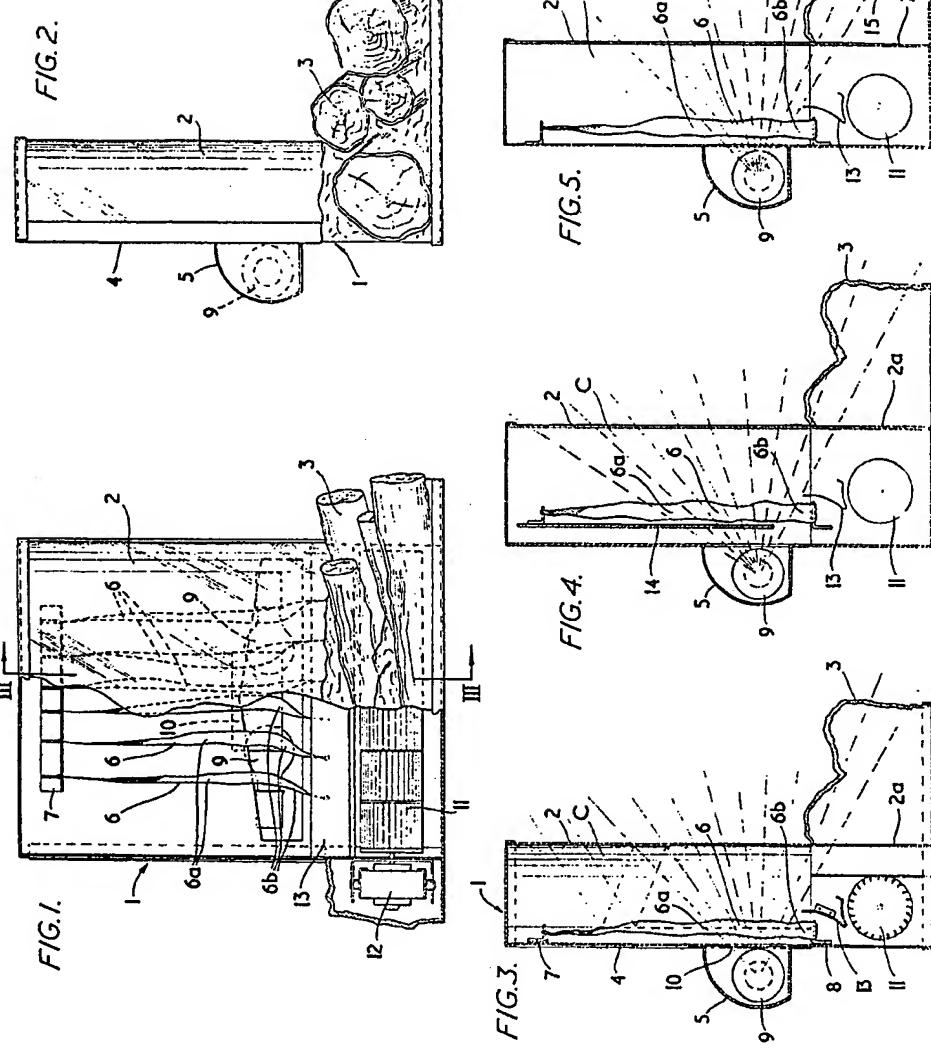


FIG. 6.

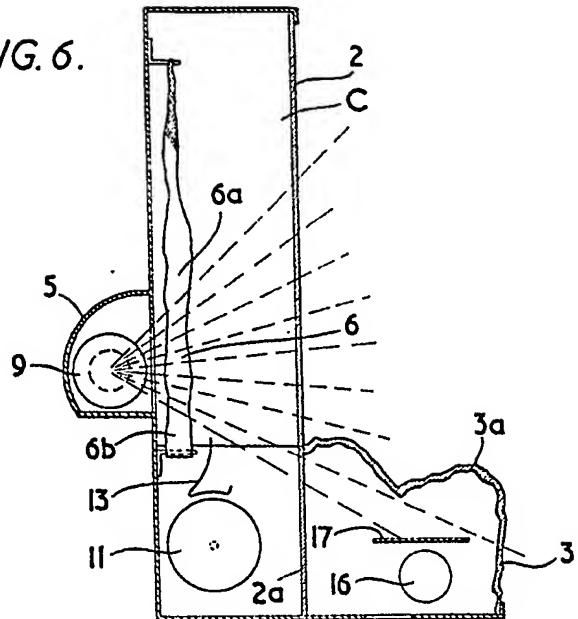
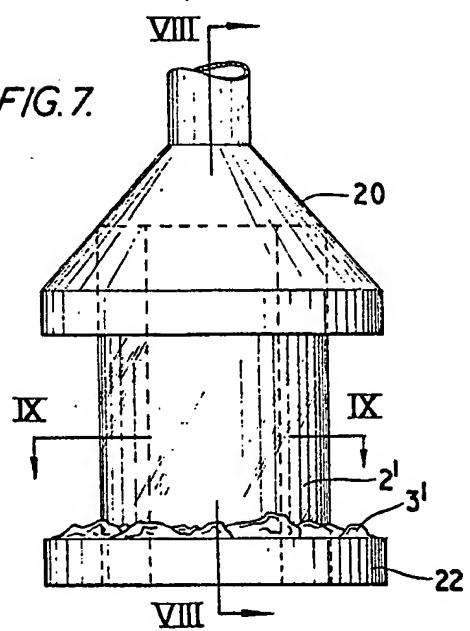


FIG. 7.



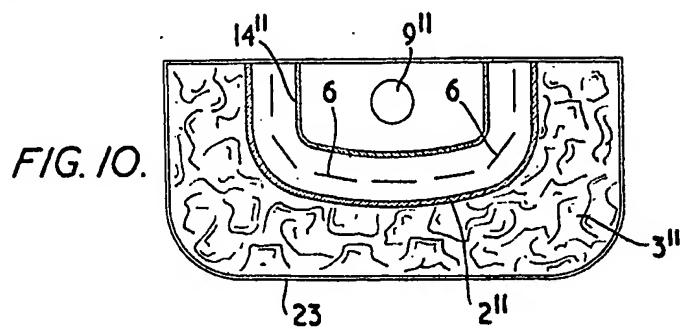
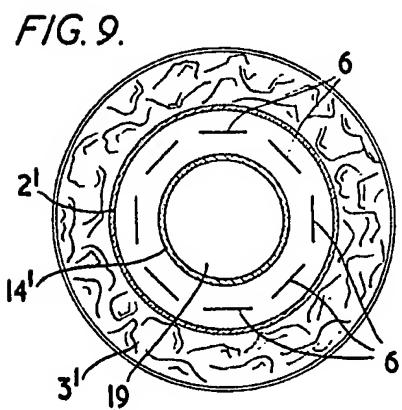
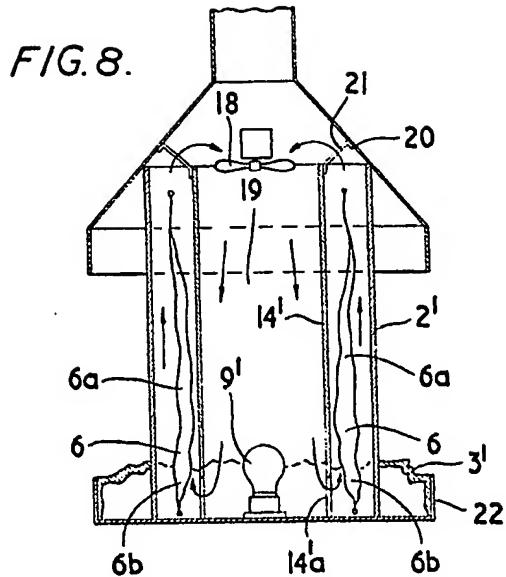
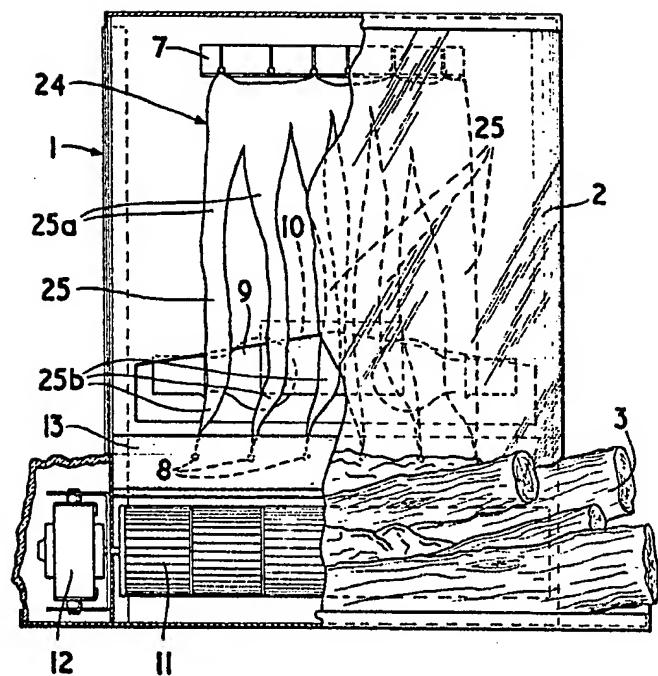


FIG. II.



**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.